Washington Transportation Plan Update

Phase 2 Workshop

Demand – Capacity Imbalance

System Efficiencies and Bottlenecks and Chokepoints

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April 19, 2005

Washington State Department of Transportation

Topics to cover today:

Recap WTP update process to date

- Where we've been in Phase 1
- Timeline to complete the WTP

Commission's new revenue proposal and how it relates to today's workshop

Guiding Principles

- Policy & Strategy "To Do's"

Preview of Areas of Targeted Investment

For April's two workshops we talk about four issues that are closely linked to the Demand-Capacity Imbalance:

- System Efficiencies
- Bottlenecks & Chokepoints

} On Tuesday

- Moving Freight
- Building Future Visions

} On Wednesday

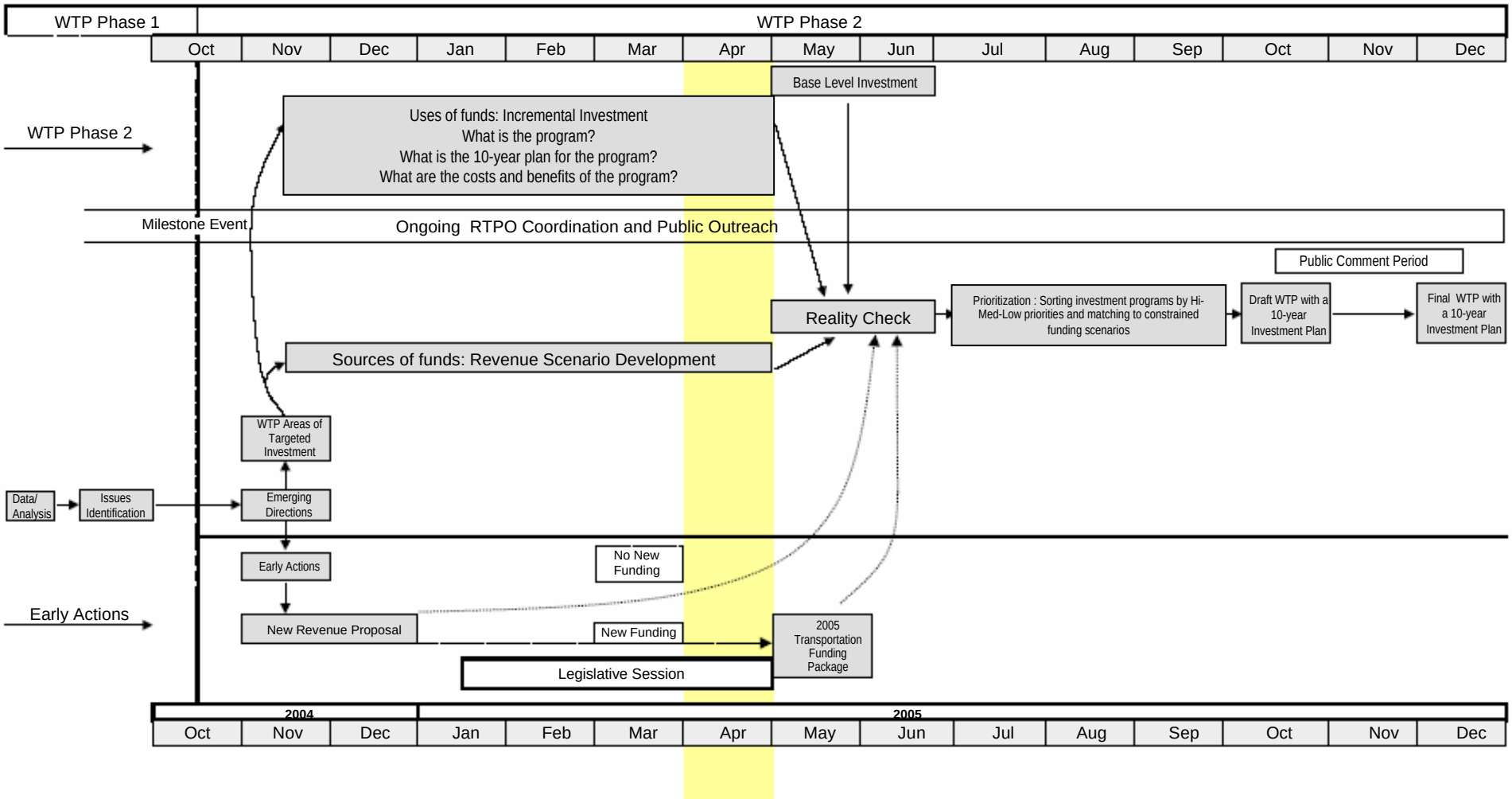
Action requested today:

- Concurrence on the statutory and policy guidance
- Concurrence on the "To Do" policy and strategy proposals
- Concurrence on investment proposals to continue into later prioritization stages

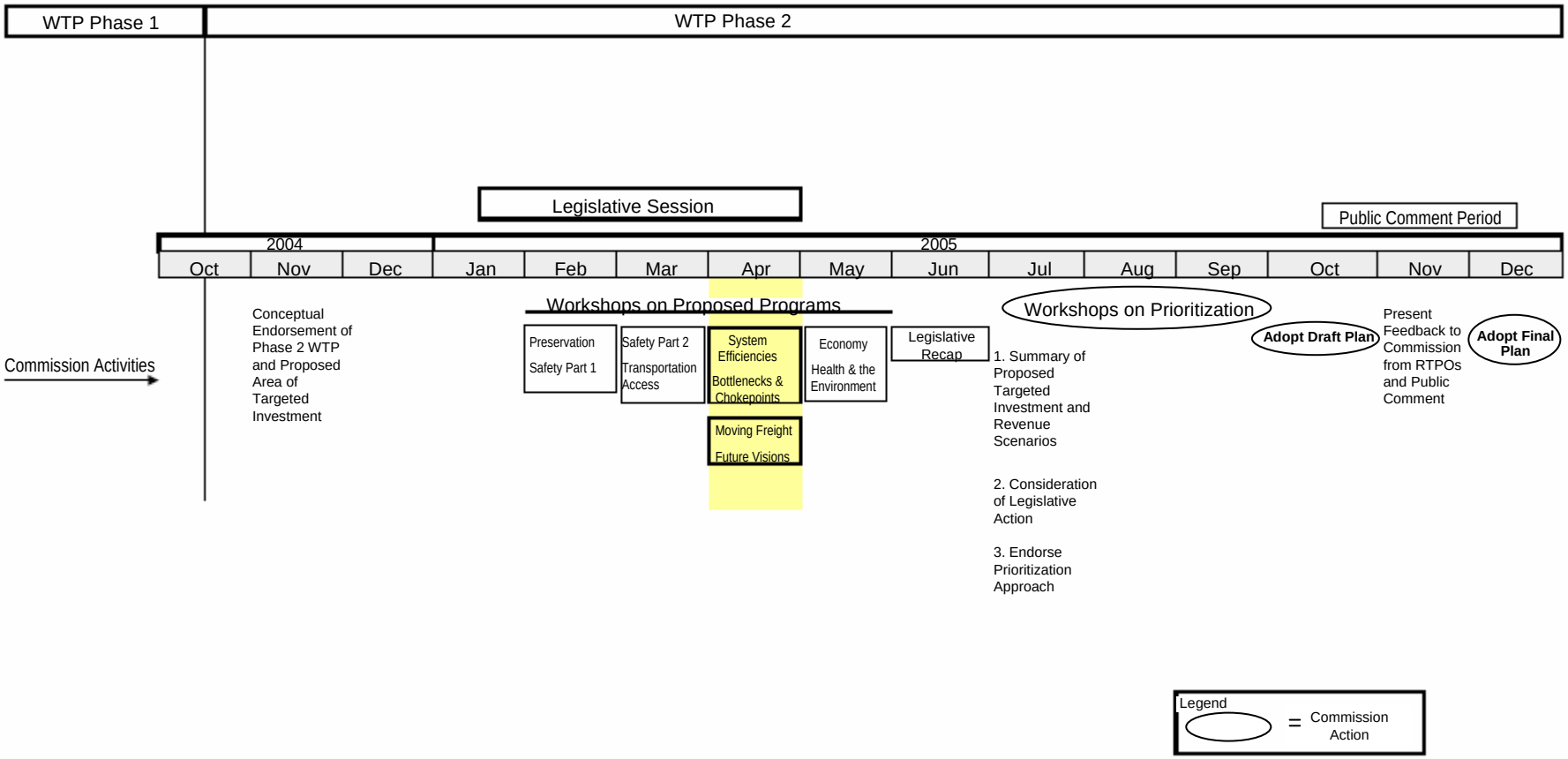
Aspiration for the 2005 Plan Update

- Data driven, analytically grounded and organized by major issue areas.
- Program and investment proposals advanced for the state for each major issue area.
  - Areas of Targeted Investment identified at the program level to implement existing and proposed policies and strategies for each issue.
- Investment and programs proposals prioritized into high, medium, and low priority categories.
- Scale of proposed investment constrained by financial realities.
  - Financial scenarios will provide a range of options for constraining the plan to available and projected revenues.

WTP Phase 2 Work Plan



WTP Phase 2 Work Plan



How is the Process Taking Shape?

Phase 1: Data and Approach Development

- Build statewide transportation "data library" (http://www.wsdot.wa.gov/planning/wtp/datalibrary)
- Analyze statewide trends and system conditions
- Identify key issues and choices
- Share the learning and analysis with others
  October 19, 2004 Milestone Event and folios

Phase 2: Developing the Plan Update

- Commission guides tentative judgments on scale and direction of investment programs
- WSDOT works with RTPOs and others to develop proposals for investment plans and funding scenarios
- Commission matches priorities to funding scenarios
- Commission adopts the plan

Strategic Issues for this Update

- ✓ System Preservation
- ✓ Safety
- ✓ Transportation Access
- ✓ **System Efficiencies**
- ✓ **Bottlenecks and Chokepoints**
- ✓ **Moving Freight**
- ✓ **Building Future Visions**
- ✓ Strong Economy and Good Jobs
- ✓ Health and the Environment

On Tuesday, April 19 we will cover System Efficiencies and Bottlenecks & Chokepoints. On Wednesday, we will cover Moving Freight and Building Future Visions.

Sample key for upcoming proposal slides – A quick reference tool.

Guiding Principles that we'll discuss in the workshop

System Efficiencies

Support US, state, and metro area economic vitality global competitiveness, productivity, and efficiency
(23 CFR 135)

Enhance transportation system integration and connectivity across and between modes statewide for people **(23 CFR 135)**

Reduce state urban highway congestion and average delay to be no worse than national mean. Per capita vehicle miles traveled shall be maintained at 2000 level. Non-auto share of commuter trips shall be increased in urban areas. **(RCW 47.01.012)**

Continuity and systematic development of the highway transportation network. **(RCW 47.05.051)**

Improve and integrate all modes to create a seamless transportation system. **(RCW 47.06)**

Encourage innovation in reducing SOV commute trips by competitively distributing performance grants. **(RCW 70.94.996)**

Commission:
Corridors to operate with minimal delay and continual reduction in societal, environmental and economic costs.

The transportation system operates effectively, efficiently, and predictably.

Consider, and implement where appropriate, operational changes that improve efficiency before expanding the existing transportation system.

Incorporate long-term operations needs in capital investment decisions.

Aggressively pursue access management to protect operations of existing and future systems.

Promote modal connections to provide seamless travel to the customer.

Bottlenecks & Chokepoints

"The legislature intends that funding for transportation mobility improvements be allocated to the worst traffic chokepoints in the state. Furthermore, the legislature intends to fund projects that provide systemic relief throughout a transportation corridor, rather than spot improvements that fail to improve overall mobility within a corridor." **(RCW 47.05)**

Relieve Congestion. Provide mobility for people and goods. **(RCW 47.05.010)**

It is the intent of the legislature that investment of state transportation funds to address deficiencies on the state highway system be based on a policy of priority programming having as its basis the rational selection of projects and services according to factual need and an evaluation of life cycle costs and benefits that are systematically scheduled to carry out defined objectives within available revenue. **(RCW 47.05.010)**

Improvement program to address congestion and increase mobility. **(RCW 47.05.030)**

Priority programming for the improvement program must be based primarily upon or consider congestion, delay, accidents, the cost effective movement of people and goods. **(RCW 47.05.051)**

Commission:
Promote land use management, telecommunications and other innovative technologies as viable mobility options to reduce the impact of congestion on all system users.

Support limited strategic expansion to accommodate growth and reduce congestion when possible.

Use cost-benefit methodologies as key determinants in selecting mobility projects.

Develop good connections across interstate and international borders.

The April Commission WTP workshops discuss issues that address the Demand-Capacity Imbalance

The Demand-Capacity Imbalance*
Four Interconnected Issues

Nine WTP Issues

- ✓ System Preservation
- ✓ Safety
- ✓ Transportation Access
- ✓ **System Efficiencies**
- ✓ **Bottlenecks and Chokepoints**
- ✓ **Moving Freight**
- ✓ **Building Future Visions**
- ✓ Strong Economy & Good Jobs
- ✓ Health & the Environment

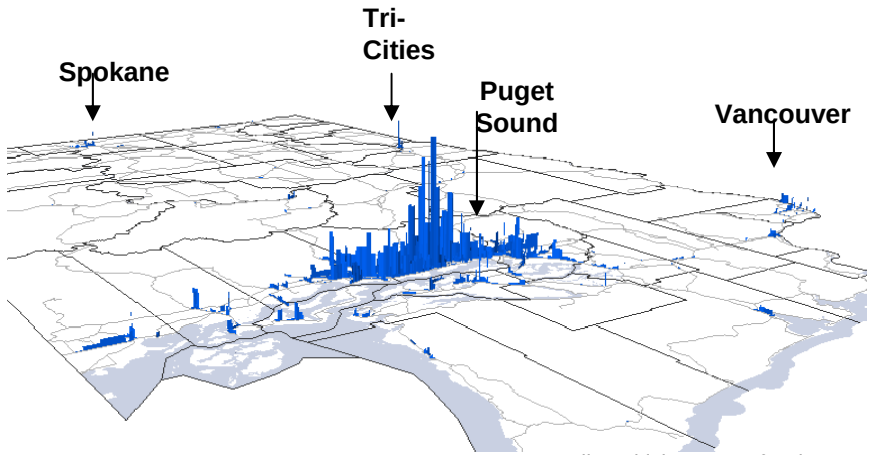
Achieving Better Balance

- **Maintaining flow**
- **Maximizing throughput**
- **Improving productivity**

*A condition when peak period demand exceeds capacity

What are we finding about the demand/capacity imbalance?

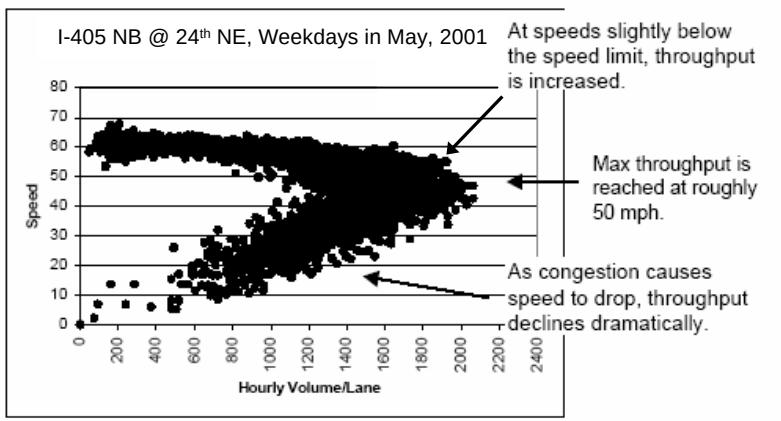
- Demand is growing, and the demand/capacity imbalance will continue to grow in the future, leading to more congestion.
- Congestion occurs mostly in the urban areas, especially Puget Sound, Vancouver and Spokane. (92% of all delay on highways occurs in these areas.)

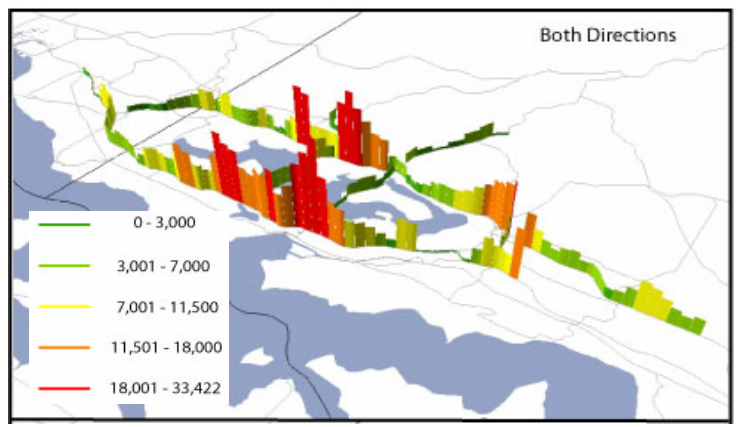


2002 Daily Vehicle Hours of Delay Per Lane Mile

- Congestion causes lost productivity: Maximum freeway throughput of about 2000 vehicles per hour occurs at speeds of 45-50 mph. Throughput drops dramatically when traffic volumes force speeds to drop below 50 mph. The capacity of the roadway actually decreases (as much as half) with congestion-induced reduction in speed.

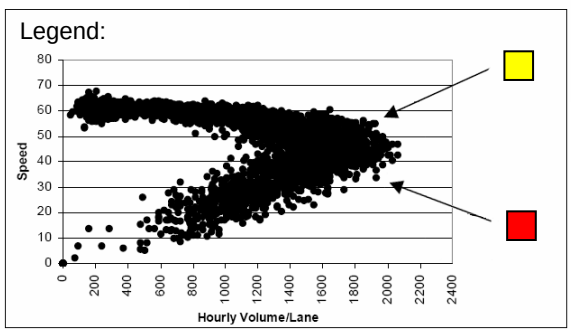
System Efficiency Example



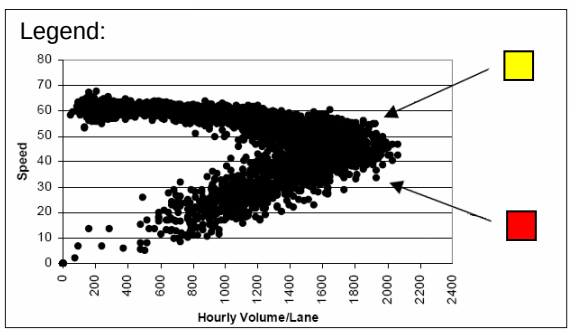


Efficiency Loss: Vehicle Throughput Reduction
Major Seattle Area Freeways

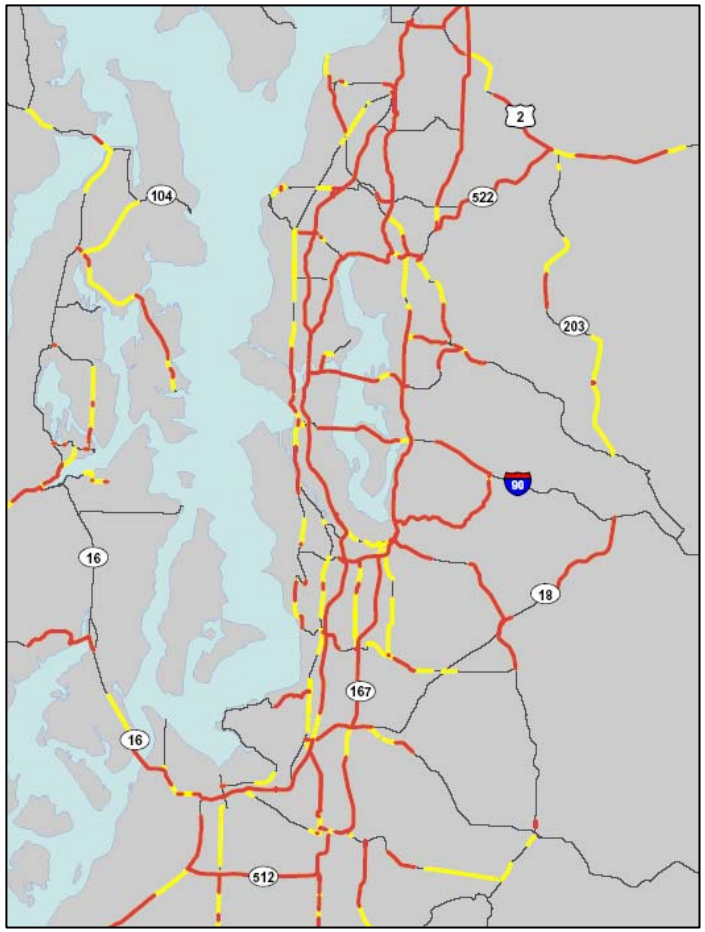
Current Statewide Conditions



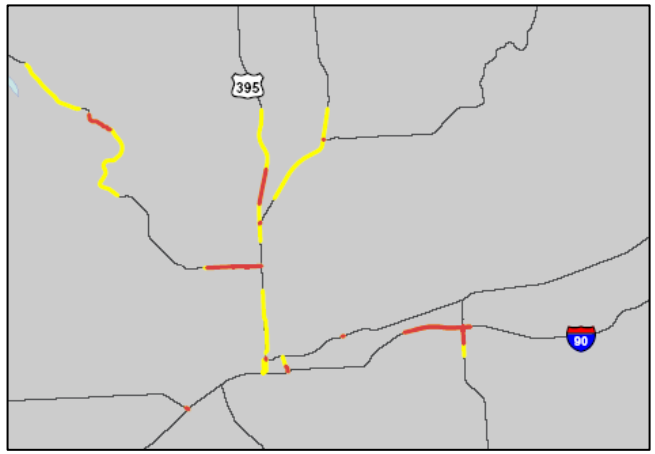
Future Statewide Conditions - 2030



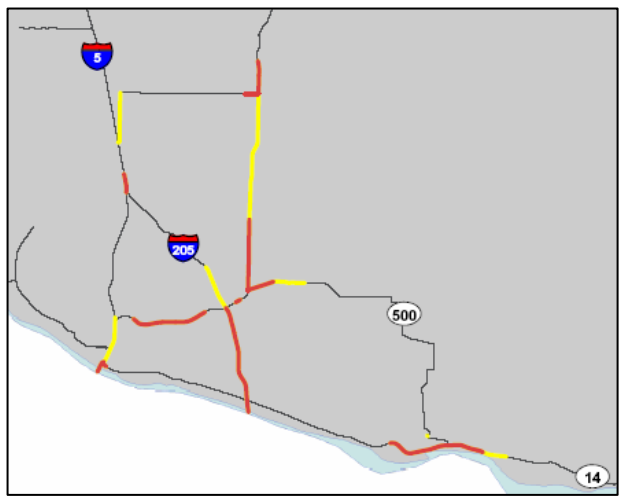
Current Urban Conditions



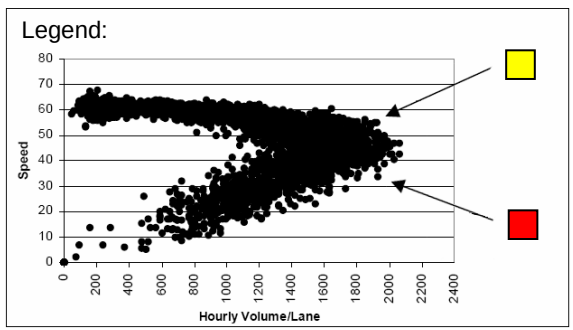
Puget Sound



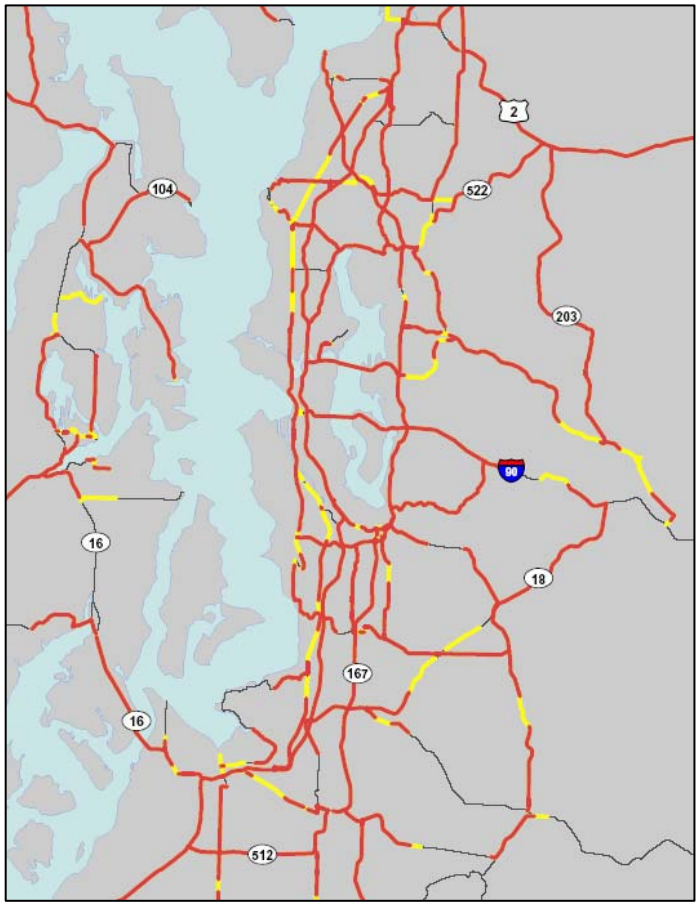
Spokane



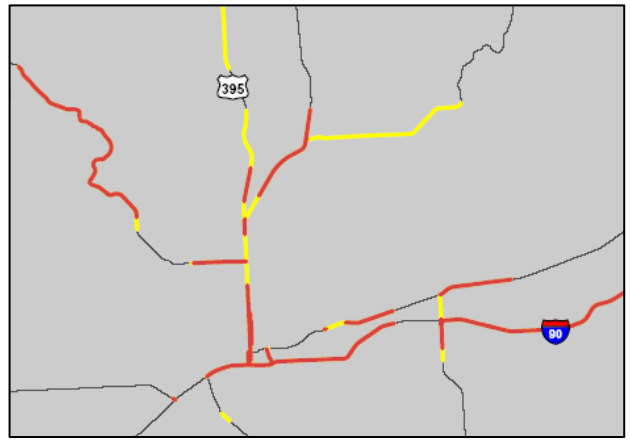
Vancouver



Future Urban Conditions - 2030

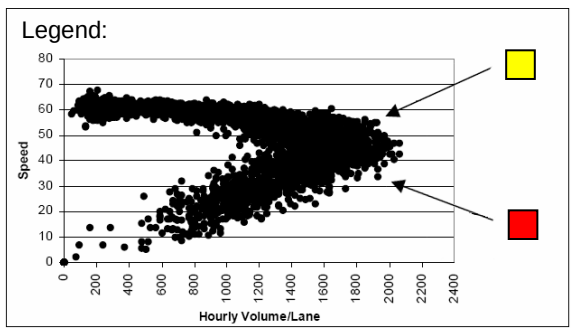


Puget Sound



Spokane

Vancouver



Flow, Throughput and Productivity

Emerging Directions

System Efficiencies:

- Improvements such as ramp metering, incident response, HOV lanes, and others have been successful at improving flow on the system.
- Strategies such as commute trip reduction programs and transit oriented development provide options.

Bottlenecks and Chokepoints:

- There are locations on the system where system geometry and traffic patterns contribute to congestion and reduce throughput capacity.
- Targeted capital investments at these locations would be less expensive than full corridor build-outs, but could deliver significant delay savings and restored productivity.
- Corridor completion in certain locations (SR395, SR509, SR167, SR18, SR704, and High Occupancy Vehicle (HOV) Core routes) are higher cost ways to address the demand-capacity imbalance.

Building Future Visions:

- New or major corridor expansion will need to be considered in the future.

The entire system is interconnected in improving the demand-capacity imbalance

Basic maintenance and operations are the cornerstones of keeping the system moving.

As congestion grows, more sophisticated technologies are needed to maintain flow:

- Intelligent transportation system (ITS) technologies
- Incident response
- Signal optimization
- Truck operations
- Managed lanes
- Tolling

… As well as capital investments small to large, for example:

- Channelization
- Striping
- HOV Lanes
- Major truck corridors

Issues facing Washington State Ferries operations:

- Congestion and peaking in the system
- Trip reliability
- Intermodal connections

Improving public transit operations:

- System operating configuration
- Communications to manage the fleet and inform customers
- HOV lane strategies
- Park and ride lots
- Travel Conservation: Reducing or Redirecting Demand
- Transit-supportive
- Land use strategies

Passenger Rail Issues:

- Scheduling

Aviation Issues:

- Local & regional airports need better ground access

Access Management

The local system is part of the network.

System Efficiencies

How do we derive further benefits of our current transportation system facilities and those we are able to create in the future?

System Efficiencies

Guiding Principles (Statutory and Commission Policy) for System Efficiencies
Support US, state, and metro area economic vitality global competitiveness, productivity, and efficiency **(23 CFR 135)**
Enhance transportation system integration and connectivity across and between modes statewide for people **(23 CFR 135)**
Reduce state urban highway congestion and average delay to be no worse than national mean. Per capita vehicle miles traveled shall be maintained at 2000 level. Non-auto share of commuter trips shall be increased in urban areas **(RCW 47.01.012)**
Ongoing and systematic development of the highway transportation network. **(RCW 47.05.051)**
Improve and integrate all modes to create a seamless transportation system. **(RCW 47.06)**
Encourage innovation in reducing SOV commute trips by competitively distributing performance grants. **(RCW 70.94.996)**
Commission: Corridors to operate with minimal delay and continual reduction in societal, environmental, and economic costs.
The transportation system operates effectively, efficiently, and predictably.
Consider, and implement where appropriate, operational changes that improve efficiency before expanding the existing transportation system.
Incorporate long-term operations needs to capital investment decisions.
Aggressively pursue access management to protect operations of existing and future systems.
Promote modal connections to provide seamless travel to the customer.

What might this mean?
• Investments that make the system more efficient are among the very best choices for gaining value from existing transportation assets. Usually, choices that make the existing system more efficient should be undertaken before choices to add new systems.
• New technologies will be an important source of efficiency gains. Goals and visions for efficiency must anticipate tomorrow's technologies as well as take advantage of today's. For highway systems, the expanding uses of in-vehicle technologies must be in the forefront of transportation system planning.
• Placing a price on the uses of all transportation systems – existing as well as new – will harness market mechanisms for achieving and consolidating efficiency gains. Because new system assets are so expensive, pricing mechanisms must be developed to help manage (as well as pay for) transportation systems as rapidly as new technology and public acceptance will permit. Transportation investment needs are frustrated, not advanced, by continuing the widely-held societal perception that transportation infrastructure is a "free good."
• New transportation assets must be planned on a life-cycle cost basis and take account of up-front investments to promote efficiency wherever possible. Fuel efficiency, for example, must be a clear concern for new ferry boats, and upfront installation of "smart car/smart highway" technologies must be incorporated into new highway investment.
• Opportunities for modes of transportation to gain efficiency by linkage and connections to one another should be sought and taken where available.
• Non-dominant transportation modes (for example, walking or cycling to work or school, or intercity passenger rail or bus) may make important efficiency contributions to the system and otherwise contribute to the well-being of communities (e.g., reductions in demand for land for streets and automobile parking). Long-term cost-effective investments in these areas may be attractive for the sake of efficiency.
• Demand management strategies that improve system efficiencies (for example, incentives to reduce single occupancy vehicle needs, or support for land use patterns that take advantage of and support citizen's abilities to rely on efficient systems such as transit systems) are an important contributor to system efficiency.
• Gains in system efficiency are closely linked to other policy goals. Improved safety, for example, is both an outcome or efficiency and a way to measure its progress. Efficiency in movement of goods in commerce serves economic productivity. More efficient systems support environmental and health goals for transportation planning.

	System Efficiencies
"To Do" Policy	**System Tolling** Develop a policy for Imposing Tolls (Longer Term) **Corridor Efficiency** Develop a policy for Park & Ride Facilities (Longer Term)
"To Do" Strategy	**System Tolling** Develop a strategy for imposing tolls on segments of the highway system to achieve improved efficiency and/or generate funding for specific projects. (Longer Term) **Corridor Efficiency** Develop a strategy for closer integration between roadway and transit operations (Longer Term, Legislation Pending) **Aviation** Complete aviation system plan with classification of airports and performance standards (Underway)
Proposed Areas of Targeted Investment	**Highway** Commitment to Basic Maintenance Traffic Operations Efficiency Intelligent Transportation Systems **Ferries** Continue Demand Management & Operational Strategies Priority Loading Smart Card Development **Public Transportation** Transit expansion within corridors for peak period efficiency gains (Rush hour transit in congested corridors) Expanded travel conservation approaches Transportation Demand Management Commute Trip Reduction High Occupancy Vehicle Lanes Park and Ride Facilities **Passenger Rail** Amtrak *Cascades* passenger service

System Efficiencies

Develop a Tolling System Policy, Strategy, and Program

What is the Problem?

Growth in population, employment, and vehicle miles traveled (VMT) has outpaced our ability to finance new major capacity improvements. Resulting congestion has eroded the efficiency of our roadway system. Imposing tolls can increase the efficiency of our existing transportation system and potentially generate revenue for transportation investments.

Description of Proposal

Create a statewide tolling system program to coordinate development and technology integration for all tolling projects. This will include:

- **"One state, one toll system, one tolling authority"**
- Tolling system policy – "Manage capacity to optimize the transportation system and where needed or possible raise revenue"
- Develop a program structure and coordination with Commission as Tolling Authority
- ***Statewide Tolling Feasibility Study.*** This study will be the basis for a plan to implement tolling at one or more locations in the state. Study elements include project or corridor specific:
  - Traffic and engineering analysis
  - Technology analysis
  - Impact assessment – divergence of traffic to other facilities
  - Performance
  - Financial assessment – "willingness to pay"
  - Legal and policy issues

Type of Proposal

- [x] Policy
- [x] Strategy
- [ ] Capital
- [ ] Operating

Expected Benefits

- [ ] Preservation
- [ ] Safety
- [ ] Transportation Access
- [x] System Efficiencies
- [ ] Future Visions
- [ ] Bottlenecks & Chokepoints
- [ ] Moving Freight
- [ ] Economy
- [ ] Health & Environment

All or Part Included in '05 – '07 Commission Funding Recommendation?

[ ] All [x] Part [ ] None

Funded in Current Law Budget

[ ] All [x] Part [ ] None

System Efficiencies

Develop a Tolling System Policy, Strategy, and Program, cont'd

Description of Benefits/Impacts of Implementing the Proposal

- Coordinate tolling projects:

  - Potential for joint toll processing center and equipment procurement
  - Marketing and customer service
  - Tolling technology that makes it easy for drivers to use toll roadways and the ferry system.

- Increase the efficiency of existing transportation system (i.e. SR 167 HOT lanes and potentially toll express lane systems) to increase throughput in corridors.
- Advance critically needed projects by paying a portion of the capital cost with user tolls.

Current Projects:

- Tacoma Narrows Bridge: operational in 2007
- SR 167 High-Occupancy Toll (HOT) lanes pilot project: pending legislative authorization and funding
- Columbia River Crossing (Vancouver): tolling analysis
- I-5, SR-167, I-405: Tolling and high-occupancy toll lanes analysis
- SR-520: Tolling analysis, as a primary funding strategy –
- Congestion Relief Analysis: Improve Puget Sound traffic model
- PSRC Value Pricing Project

2005 Legislative Activity:

- SR 167 HOT Lanes Pilot Project
- Bills requiring tolling studies:

  - Regional Transportation Improvement Authority (RTIA), including the Puget Sound value pricing study

  - Public Innovative Partnerships

- Tolling RCW "Clean-Up"

Tolling Strategies

System-Wide Tolling

- Charges accrue over <u>all</u> roads, from driveway to highway. Fee based on actual use of the road.
- "Dynamic Pricing" (variable pricing based on demand) may be applied in this form of congestion pricing.
- Minnesota and Oregon are studying and testing systems.
- PSRC will study a GPS incentive based system testing pricing as a driving behavior modifier.

- Germany's truck toll system has had numerous delays due to technical difficulties.

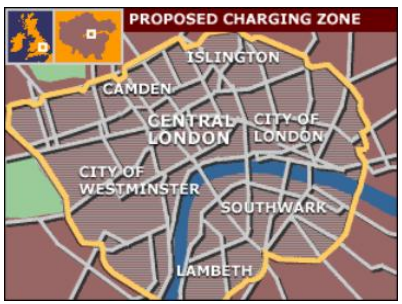
Network Tolling

Transponder

- Limited access facilities. Dynamically priced based on traffic volumes and delay.
- Until late 1980's federal policies discouraged tolls roads or imposing tolls on existing highways.
- Diminished road funding, advances in tolling technology, and more liberal federal policies have led to a resurgent interest in pricing roads.
- Advances in electronic toll collection now provide for "at speed" (no tollbooth) collection of tolls.

Cordon Tolling

- All drivers are charged a toll when entering an area, such as a downtown district.
- Singapore (1975 – electronic since 1998)
  - Central Business District and ring roads
  - Reduced number of solo drivers.
- London (2003)
  - Central Business District (8 sq. miles)
  - Photo tolling (688 cameras / 203 sites)
  - Congestion reduced 17%



High-Occupancy-Toll (HOT) Lanes

- SOVs can buy into HOV lanes (1 or 2 lanes) when there is available capacity.
- Almost 20 different projects using or studying HOT lane applications in US.
- **Proposed**
  - SR 167 (King County, WA)
  - I-95 (Miami, FL)
- **Operational or Under Const.**
  - I-10 & US 290 (Houston, TX)
  - I-15 (San Diego, CA)
  - SR 91 (Orange County, CA)
  - I-394 (Minneapolis, MN)
  - I-25 / US 36 (Denver, CO)
- **System-Wide Studies**
  - Minneapolis, MN
  - Atlanta, GA
  - Washington, DC Beltway (VA)

System Efficiencies

Corridor Efficiency–Park and Ride Facilities

What is the Problem?

In Washington state there are close to 300 park and ride facilities and nearly one-third are owned or leased by the department. The department does not have a policy to guide the role of WSDOT in park and ride lots. In addition, there is an unknown need for the expansion and development of park and ride lot capacity and what the state role should be in that effort. Transit service and park and ride lots must develop in conjunction with each other in order to fully realize the effectiveness of those services.

Description of Proposal

In coordination with transit agencies, WSDOT will develop a set of policies to help guide the development of a comprehensive park and ride program.

Description of Benefits/Impacts of Implementing the Proposal

Development and implementation of a park and ride policy will help define the role of WSDOT and improve the efficiency of our roadway system. This policy will serve as a guide for the department's long-term park and ride lot program.

Type of Proposal

- [x] Policy
- [ ] Strategy
- [ ] Capital
- [ ] Operating

Expected Benefits

- [x] Preservation
- [ ] Safety
- [ ] Transportation Access
- [x] System Efficiencies
- [ ] Future Visions
- [x] Bottlenecks & Chokepoints
- [ ] Moving Freight
- [ ] Economy
- [ ] Health & Environment

All or Part Included in '05 – '07 Commission Funding Recommendation?

- [ ] All
- [x] Part
- [ ] None

Funded in Current Law Budget

- [ ] All
- [ ] Part
- [x] None

System Efficiencies

Corridor Efficiency–Develop a strategy for closer integration between roadway and transit operations

What is the Problem?

We do not have good integration of transit operations planning in our roadways planning process. Route development plan standards do not consistently include transit considerations in department construction projects and do not typically provide funding for transit-supportive planning and implementation.

Description of Proposal

Improve the integration of transit operations in the department's route development plan process. Include such measures such as prioritizing transit operations at intersections, integrating the siting of bus stop locations for greater transit efficiency, and effective pedestrian access for transit locations. WSDOT, in collaboration with transit agencies, will develop a program to fund transit services that create efficiencies in congested corridors.

Description of Benefits/Impacts of Implementing the Proposal

Increases person throughput on existing corridors and improves the efficiency of the roadway system through greater use of transit, particularly in densely populated areas.

Type of Proposal

- ☐ Policy
- ☑ Strategy
- ☐ Capital
- ☐ Operating

Expected Benefits

- ☐ Preservation
- ☑ Safety
- ☑ Transportation Access
- ☑ System Efficiencies
- ☐ Future Visions
- ☑ Bottlenecks & Chokepoints
- ☐ Moving Freight
- ☐ Economy
- ☑ Health & Environment

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☐ All ☐ Part ☑ None

Funded in Current Law Budget

☐ All ☐ Part ☑ None

System Efficiencies

Aviation

Complete Aviation System Plan With Classification of Airports and Performance Standards

Type of Proposal

- [ ] Policy
- [x] Strategy
- [ ] Capital
- [ ] Operating

Expected Benefits

- [ ] Preservation
- [ ] Safety
- [x] Transportation Access
- [x] System Efficiencies
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- [x] Moving Freight
- [x] Economy
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- [x] None

Funded in Current Law Budget

- [x] All
- [ ] Part
- [ ] None

What is the Problem?

Each airport in Washington contributes to the aviation system by supporting different types and levels of aviation activity. However, many airports do not meet current facility and service level demand objectives and therefore their maximum potential within the overall system is not being realized.

Description of Proposal

The Aviation Division is in the process of developing an airport classification system based on the role and airport service level. Performance measures will be identified to evaluate airport deficiencies based on their functional role and to increase performance target levels. Airport deficiencies will also be evaluated to identify airport facility and service development costs needs. The Aviation Task Force met in 2004 and identified five airport classes, which included commercial, regional, local/community, recreation or remote, and seaplane base categories.

Description of Benefits/Impacts of Implementing the Proposal

To optimize the potential of the aviation system to meet future aviation demand and to facilitate economic opportunity within the state.

Regional Airport
Snohomish Co./Paine Field

Local/community Airport
Moses Lake Municipal Airport

System Efficiencies

Highway—Commitment to Basic Maintenance

Type of Proposal
☐ Policy
☐ Strategy
☐ Capital
☑ Operating

Expected Benefits
☐ Preservation
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☐ Health & Environment

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Funded in Current Law Budget
☐ All ☑ Part ☐ None

What is the Problem?

Each biennium there are changes to the transportation system that influence the maintenance, and consequently, the efficiency of the roadway. Our aging population influences the types of materials we use and increases our need to explore and implement new technologies. Roadway striping, snow and ice control, and performance measurement are just a few of the areas that face significant changes in the future.

Description of Proposal

The proposal is to improve our processes to assess how we program maintenance activities to continue to provide the current service level as the size and complexity of the highway system increases and the aging population expects safer, and more efficient roadways. Increased funding would support additional workforce, equipment, and materials to maintain system additions. Increased costs for implementing new technologies, utilizing different work methods, and improved information management would help to meet the expectations and needs of our changing society.

These are the changes in Maintenance.

Changes	Examples
System Additions	Nickel Projects
Inflation	Rising Fuel Prices
Changing Requirements	Water Quality Permits
System Wear and Tear	Vehicle Miles Traveled
Changing Societal Needs	Aging Population
Changing Mgt. Needs	Accountability
Risk Management	Snow and Ice Plan

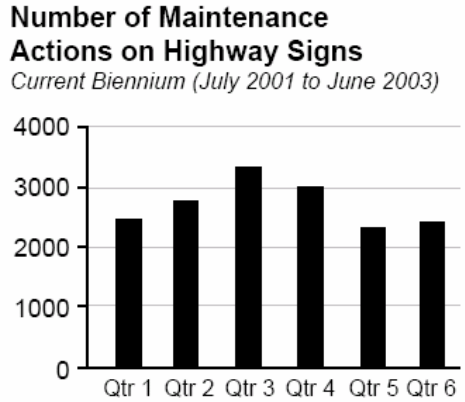
Description of Benefits/Impacts of Implementing the Proposal

Additional funds to keep pace with the increasing requirements of maintenance and operations will provide for the continued levels of safety, mobility, and reliability that are currently provided on the highway system.

Examples of Basic Maintenance

WSDOT's new truck-mounted auger and punch. *Rich Grubb of WSDOT's North Central Region demonstrates operation.*

Pavement Striping
Wear and tear requires that stripes must be repainted each year



Maintenance on highway signs includes repairing or replacing damaged signs or posts and washing signs that are not readable.

Snow and Ice control
This is one of the most important and rapidly changing activities in maintenance

The Maintenance Accountability Process (MAP)

MAP targets, measures, and communicates the outcomes of 34 distinct highway maintenance activities. Maintenance results are measured using field condition surveys, and are reported as service level ratings.

WSDOT Maintenance Targets Achieved for 2004

Maintenance Activity	Pass	Fail
Movable & Floating Bridge Operations		x
Traffic Signal System Operations	x	
Snow & Ice Control Operations	x	
Keller Ferry Operations	x	
Structural Bridge Repair	x	
Urban Tunnel Systems Operations	x	
Intelligent Traffic System Operations	x	
Regulatory Sign Maintenance	x	
Slope Repairs	x	
Maintain Catch Basins & Inlets	x	
Pavement Patching & Repair	x	
Bridge Deck Repair	x	
Guardrail Maintenance	x	
Pavement Striping Maintenance	x	
Raised/Depressed Pavement Markers	x	
Rest Area Operations	x	
Sweeping and Cleaning	x	

WSDOT Maintenance Targets Achieved for 2004

Maintenance Activity	Pass	Fail
Highway Lighting Systems Operations	x	
Guidepost Maintenance	x	
Safety Patrol	x	
Maintain Culverts	x	
Control of Vegetation Obstructions	x	
Permits/Franchises	x	
Pavement Marking Maintenance	x	
Shoulder Maintenance	x	
Guide Sign Maintenance	x	
Noxious Weed Control	x	
Bridge Cleaning & Painting	x	
Maintain Detention/Retention Basins	x	
Nuisance Vegetation Control	x	
Landscape Maintenance	x	
Crack Sealing	x	
Litter Pickup	x	

System Efficiencies

Highway—Traffic Operations Efficiency

What is the Problem?

Traffic Operations management strategies should be implemented on all urban congested roadways and many rural freeways.

Description of Proposal

Operational strategies should be installed and operated wherever they can produce benefits as part of the obligation to manage roads safely and efficiently as possible. Examples of some operational activities include managing incident response teams, ramp meters, electronic message signs, communications stations, roadway/traffic web sites, and roadway weather information stations. All these and many other efficiencies require fully equipped Transportation Management Centers to detect incidents, manage traffic flow and directly link to communication systems and the media.

Description of Benefits/Impacts of Implementing the Proposal

Operational strategies can be effective in delaying the need for capacity improvements, managing traffic during construction of capacity improvements, and getting the most out of the capacity improvements. Increasing resources to perform traffic operational strategies such as ramp metering or signal synchronization has been shown to increase traffic flow, decrease delay, and decrease crashes.

Type of Proposal

- ☐ Policy
- ☐ Strategy
- ☐ Capital
- ☑ Operating

Expected Benefits

- ☐ Preservation
- ☑ Safety
- ☐ Transportation Access
- ☑ System Efficiencies
- ☐ Future Visions
- ☐ Bottlenecks & Chokepoints
- ☐ Moving Freight
- ☐ Economy
- ☐ Health & Environment

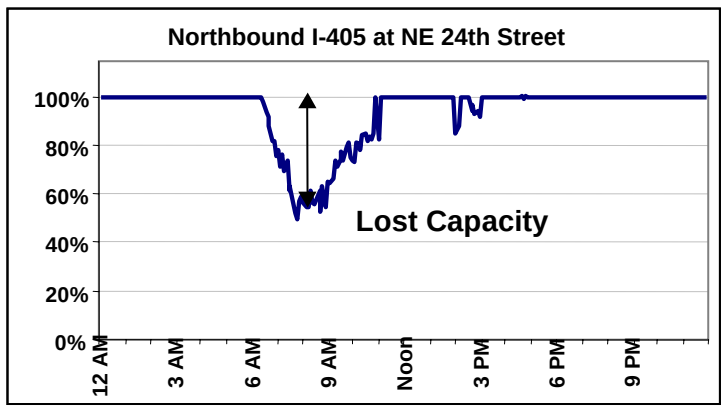
All or Part Included in '05 – '07 Commission Funding Recommendation?

☐ All ☑ Part ☐ None

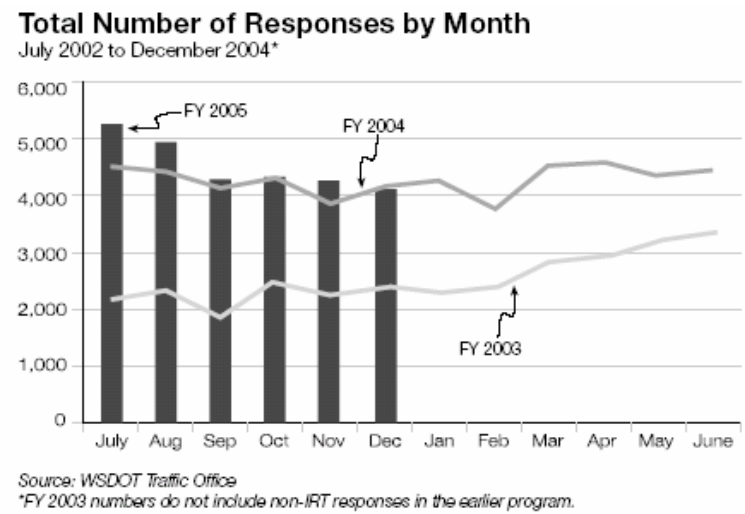
Funded in Current Law Budget

☐ All ☑ Part ☐ None

During the peak period on I-405 in Renton, congestion reduces the throughput of the two general purpose lanes to the capacity of one free flowing lane.



System Efficiencies
Highway—Traffic Operations Efficiency



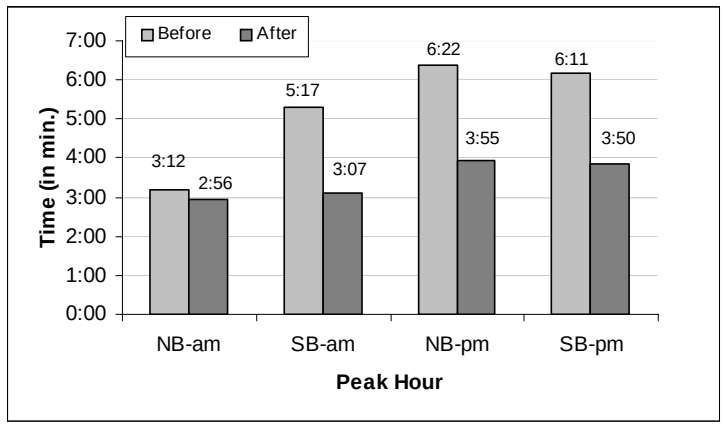
In 2004, WSDOT responded to a total of 53,197 incidents - an average of 4,433 per month, or 1,108 per week.

SR 527 Signal Optimization Project
Before and After Study

Average vehicle travel times were reduced ranging from 16 seconds (Northbound morning peak period) to 2 minutes and 27 seconds (Northbound evening peak period).

Stated otherwise, travel time improved 41% for the Southbound morning commute, and 38% for the Northbound evening commute.

Before and After Travel Times (Min:Sec)



Study conducted by the City of Bothell on retiming traffic signals on SR 527 between 228th Street SE and SR 524.

System Efficiencies

Highways - Intelligent Transportation Systems (ITS)

Type of Proposal

- ☐ Policy
- ☐ Strategy
- ☑ Capital
- ☐ Operating

Expected Benefits

- ☐ Preservation
- ☑ Safety
- ☐ Transportation Access
- ☑ System Efficiencies
- ☑ Future Visions
- ☑ Bottlenecks & Chokepoints
- ☑ Moving Freight
- ☐ Economy
- ☐ Health & Environment

All or Part Included in '05 – '07 Commission Funding Recommendation?

☐ All ☑ Part ☐ None

Funded in Current Law Budget

☐ All ☑ Part ☐ None

What is the Problem?

ITS projects can help solve our demand/capacity imbalance but ITS solution don't always fit our traditional modeling of transportation systems and often are not factored into the transportation planning and programming process.

Description of Proposal

ITS capital solutions should be integrated into the transportation planning and programming process in order for ITS to effectively perform as part of a collaborative solution. Traffic Management Centers (TMCs) are the hub of ITS and are an effective way to coordinated many systems. There are six TMCs in Washington State located in Seattle, Tacoma, Vancouver, Union Gap, Spokane, and in Bellingham. A new TMC is planned for Wenatchee, which will focus on winter maintenance operations and travel information. The TMCs should adapt to the various technologies as the demand/capacity imbalances changes.

Description of Benefits/Impacts of Implementing the Proposal

ITS can reduce motorist delay and frustration, save fuel, reduce emissions, and reduce collisions. It can defer or, in some cases, eliminate the need for large capital improvement projects. When installed with roadway capacity improvements, ITS can be an extremely cost effective way to maximize roadway efficiency.

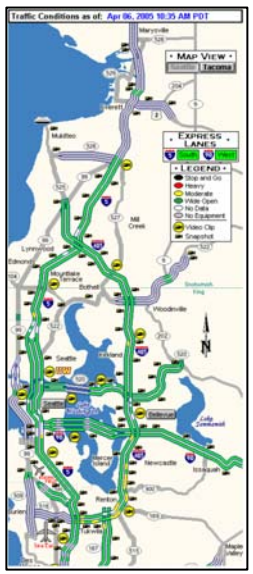
System Efficiencies TMC Existing Scenario

The Transportation Management Center is the Hub of ITS

Using Highway Advisory Signs to inform Motorists

This Transportation Management Center located in Seattle monitors, manages and directs all these Intelligent Transportation Systems at the same time.

Monitoring Ramp Metering



Real Time Flow map on website

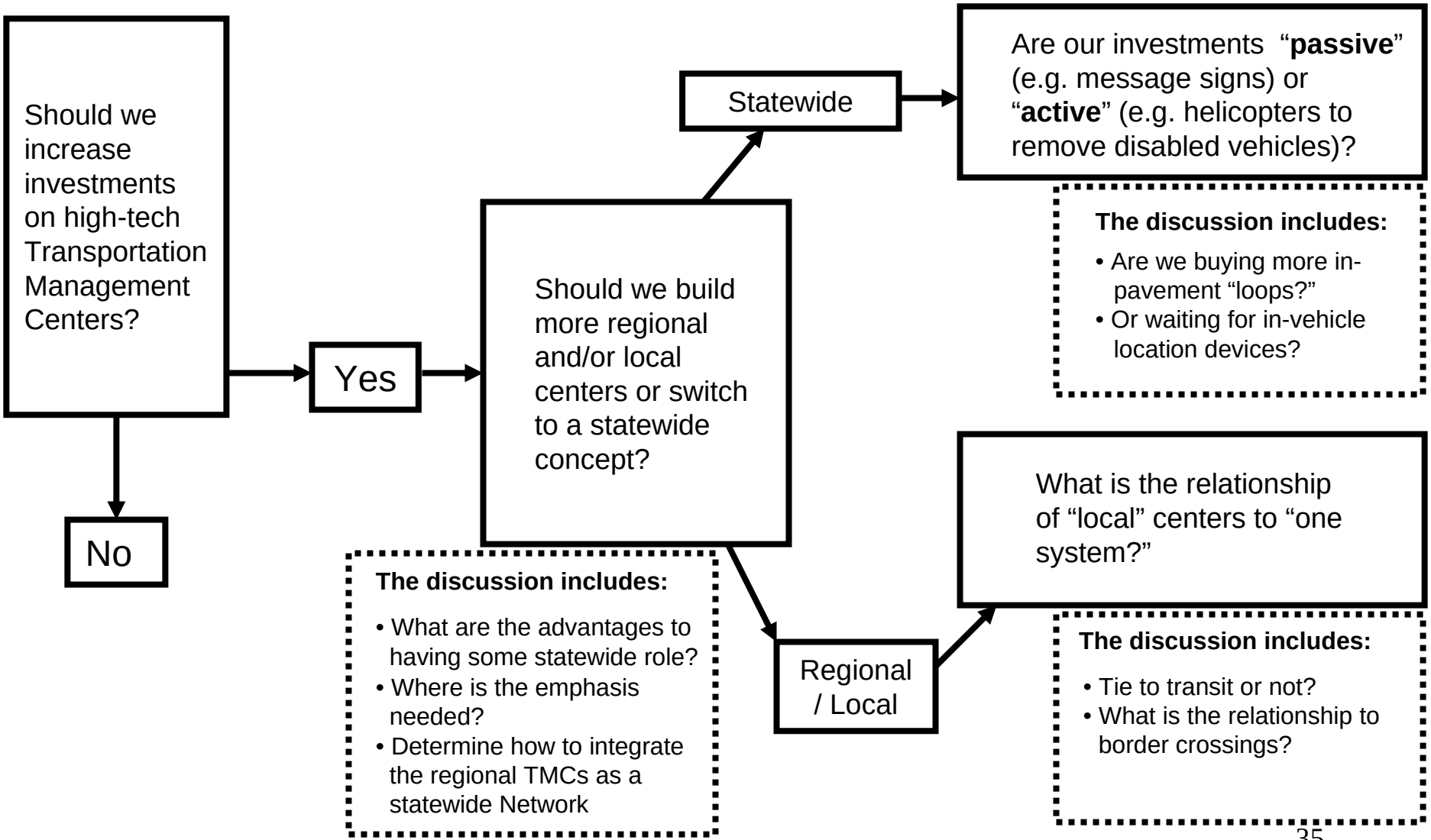
Incident Response Teams

Traffic Cameras

Dynamic Message Sign – remotely managed

System Efficiencies - Transportation Management Centers

What do we want in the future?



System Efficiencies

Ferries - Continue Demand Management and Operational Strategies

Type of Proposal

- [ ] Policy
- [ ] Strategy
- [x] Capital
- [x] Operating

Expected Benefits

- [ ] Preservation
- [ ] Safety
- [ ] Transportation Access
- [x] System Efficiencies
- [ ] Future Visions
- [ ] Bottlenecks & Chokepoints
- [ ] Moving Freight
- [ ] Economy
- [ ] Health & Environment

All or Part Included in '05 – '07 Commission Funding Recommendation?

- [ ] All
- [x] Part
- [ ] None

Funded in Current Law Budget

- [ ] All
- [x] Part
- [ ] None

What is the Problem?

At each ferry terminal and for each ferry route there are operational and demand management measures that are used to continue to improve system efficiencies and reliability. Demand for ferry service exceeds the available capacity during peak period and peak directional travel times, such as during daily commute to work times, over the weekends, during the summer tourists season and during major holidays.

Practices at some terminals and routes are currently employing a spectrum of measures to maximize efficiency short of purchasing newer bigger vessels and capital site expansion. In some cases there are physical geographical and or land use constraints that prevent the expansion of the terminal. In other cases the costs associated with fleet replacement or such terminal replacement exceed available revenues.

Description of Proposal

Continue demand management strategies, such as: transit, vanpool and car priority loading; preferential pricing for vanpools and coordinating transit operations at terminals

Continue Operational strategies such as: optimizing ferry schedules and separating vehicle and passenger loading.

Description of Benefits/Impacts of Implementing the Proposal

Demand management shifts congested vehicle traffic to passenger walk-on traffic where there is sufficient capacity. Separation of vehicle and walk–on traffic increases safety and operational efficiencies in vessel loading and offloading. Optimizing ferry schedules improves service efficiency and reliability while resulting in a reduction in fuel costs and the efficient use of crews.

System Efficiencies

Public Transportation–Transit expansion within corridors for peak period efficiency gains (Rush hour transit in congested corridors)

Type of Proposal

- ☐ Policy
- ☐ Strategy
- ☑ Capital
- ☑ Operating

Expected Benefits

- ☐ Preservation
- ☐ Safety
- ☐ Transportation Access
- ☑ System Efficiencies
- ☐ Future Visions
- ☑ Bottlenecks & Chokepoints
- ☐ Moving Freight
- ☐ Economy
- ☑ Health & Environment

All or Part Included in '05 – '07 Commission Funding Recommendation?

☐ All ☑ Part ☐ None

Funded in Current Law Budget

☐ All ☐ Part ☑ None

What is the Problem?

Many congested roadways surrounded by dense land uses are key transit corridors. While increased transit service on these corridors during peak periods would improve the efficiency of the roadway, transit agencies may not be able to add the service without decreasing existing service levels in other areas and geographic span of service.

Description of Proposal

Develop a program to increase highway efficiency in congested corridors by increasing public transportation services in coordination with transit agencies. The program would identify corridors where expanded transit services during peak periods would gain system efficiencies.

Description of Benefits/Impacts of Implementing the Proposal

The program will maintain and improve efficiency of the state and local highway system. High occupancy vehicles can carry more people than single occupant vehicles thus increasing roadway efficiency. For example, a 40-foot bus can carry 20 to 40 times the number of people a single occupant vehicle can. Well used HOV lanes carry on average more people in fewer vehicles than general purpose lanes during peak periods.

System Efficiencies

Public Transportation–Expanded Travel Conservation Approaches (Transportation Demand Management and Commute Trip Reduction)

Type of Proposal

- ☐ Policy
- ☐ Strategy
- ☑ Capital
- ☑ Operating

Expected Benefits

- ☐ Preservation
- ☐ Safety
- ☐ Transportation Access
- ☑ System Efficiencies
- ☐ Future Visions
- ☑ Bottlenecks & Chokepoints
- ☐ Moving Freight
- ☐ Economy
- ☑ Health & Environment

All or Part Included in '05 – '07 Commission Funding Recommendation?

☑ All ☐ Part ☐ None

Funded in Current Law Budget

☐ All ☑ Part ☐ None

What is the Problem?

As population continues to grow, the demand on our existing roadways will increase and it is essential that system efficiency and mobility be maintained. Transportation demand management tools such as commute trip reduction and high occupancy vehicles (transit, vanpools and carpools) help increase capacity on congested corridors. This can be a more effective solution when funding dollars are limited or when highway expansion is not feasible.

Description of Proposal

Develop new and expand existing commute strategies to expand access:

- Increase financial incentives for vanpooling
- Increase vanpool fleet
- Tax credits to employers for Commute Trip Reduction investments
- Increase the number of employers required to participate in CTR
- Develop public awareness and marketing for commute options
- Increase CTR Performance Grants to further mobility and efficiency

Following completion of the CTR Task Force work plan, consider investments in CTR measures that reduce congestion, for example increasing the number of employers required to participate in CTR.

Description of Benefits/Impacts of Implementing the Proposal

Commute strategies are an effective transportation option to reduce peak period congestion. System efficiency is gained in using higher occupancy vehicles which move more people in fewer vehicles.

System Efficiencies

Public Transportation–Expanded Travel Conservation Approaches (High Occupancy Vehicle Facilities)

Type of Proposal

- [x] Policy
- [x] Strategy
- [x] Capital
- [ ] Operating

Expected Benefits

- [ ] Preservation
- [ ] Safety
- [ ] Transportation Access
- [x] System Efficiencies
- [ ] Future Visions
- [x] Bottlenecks & Chokepoints
- [ ] Moving Freight
- [ ] Economy
- [x] Health & Environment

All or Part Included in '05 – '07 Commission Funding Recommendation?

[ ] All [x] Part [ ] None

Funded in Current Law Budget

[ ] All [x] Part [ ] None

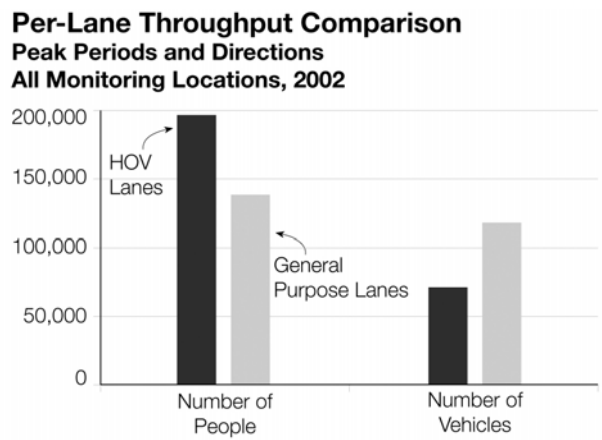
What is the Problem?

The Core Freeway HOV System is not yet complete. Increasing demand requires completion and further planning to ensure future performance and maximum use of the system. Peak period volumes in the HOV lane on I-5 and I-405 will be at capacity in the near future. Transit and shared ride modes rely upon the travel time savings and reliability provided by HOV lanes throughout the greater metropolitan area. Transit, vanpools, and carpools commuting in congested corridors are delayed along with the rest of peak period traffic in HOV lanes.

Description of Proposal

Complete the Core Freeway HOV System in the Puget Sound region. Identify the HOV system improvements and policy adjustments that will ensure continued effectiveness of the system.

Identify system-wide connectivity, performance, and coordination with congestion relief, pricing, TDM, direct access, bus rapid transit, express delivery strategies, park-and-ride lots, ITS applications, and other system improvements.



System Efficiencies

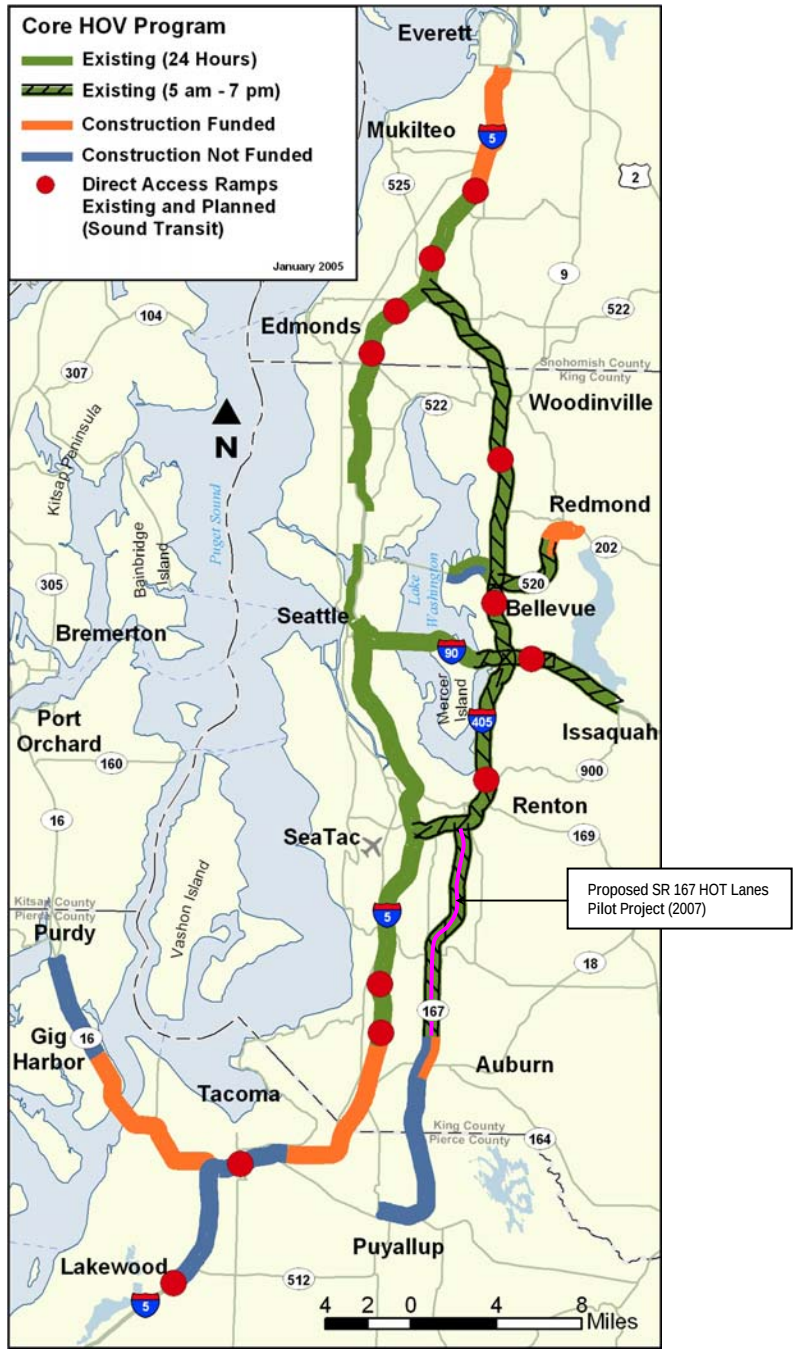
Public Transportation–Expanded travel conservation approaches (High Occupancy Vehicle Facilities)

Description of Benefits/Impacts of Implementing the Proposal

HOV lanes are effective at moving people. They provide a more efficient use of the existing system, increase the effective capacity of congested freeways, support efforts to improve air quality, and provide capacity for future growth in travel demand. They provide a measurable improvement in travel times and reliability for those who choose shared ride modes.

Core Freeway HOV Program

- Green = Existing
- Orange = Funded
- Blue = Unfunded
- Red Dots = Sound Transit Direct Access Ramps
- Pink = Proposed SR 167 HOT Lanes Project



System Efficiencies

Public Transportation–Expanded Travel Conservation Approaches (Park and Ride Facilities)

Type of Proposal
☐ Policy
☐ Strategy
☑ Capital
☑ Operating

Expected Benefits
☐ Preservation
☑ Safety
☑ Transportation Access
☑ System Efficiencies
☐ Future Visions
☑ Bottlenecks & Chokepoints
☐ Moving Freight
☐ Economy
☑ Health & Environment

All or Part Included in '05 – '07 Commission Funding Recommendation?
☐ All ☑ Part ☐ None

Funded in Current Law Budget
☐ All ☐ Part ☑ None

What is the Problem?

Statewide, there is an unknown need for the expansion and development of park and ride lot capacity. Park and ride lots allow for a more efficient use of transit and vanpool services. However, transit service and park and ride lots must develop in conjunction with each other in order to fully realize the effectiveness of those services.

Description of Proposal

The park and ride program, under the guidance of a new policy, will address capacity needs, prioritize projects, identify partnership opportunities, and critical lot needs such as security, improvements, and expansion. This topic was also described previously in the policy section.

Description of Benefits/Impacts of Implementing the Proposal

Development of a park and ride program will allow for better implementation of demand management strategies and increase the transit market share.

System Efficiencies

Passenger Rail–Expanded Travel Conservation Approaches (Existing Amtrak *Cascades* Passenger Rail Service)

Type of Proposal
☐ Policy
☐ Strategy
☐ Capital
☑ Operating

Expected Benefits
☐ Preservation
☐ Safety
☑ Transportation Access
☑ System Efficiencies
☐ Future Visions
☐ Bottlenecks & Chokepoints
☐ Moving Freight
☐ Economy
☑ Health & Environment

All or Part Included in '05 – '07 Commission Funding Recommendation?

☐ All ☑ Part ☐ None

Funded in Current Law Budget

☐ All ☑ Part ☐ None

What is the Problem?

The intercity passenger rail program envisioned in the early 1990s is dependent upon the availability of substantial federal and state funding. The lack of federal funding to date and the reduced availability of state funds have framed the scope of the existing Amtrak Cascades passenger rail program. However, additional operational investments are necessary to maintain the existing level of service for the intercity rail program.

Description of Proposal

Provide for the support, administration, coordination and planning for passenger rail including subsidies for the Amtrak Cascades Services and the following capital components:

- Management and funding of track system improvements and acquisition of passenger train equipment; Overhaul the three state owned Amtrak Cascades trainsets, including interior and mechanical upgrades and replacements.
- Change the track and platform configuration for King Street Station to meet the capacity requirements of projected intercity, commuter and through freight rail traffic.

Description of Benefits/Impacts of Implementing the Proposal

Improved connections to regional transportation services, expanded range of facilities and increased system efficiency through intercity passenger rail service.